

With the UK continuing to suffer erratic weather, irrigation has become more important than ever. Adrian Mortram investigates water management provisions and gives advice on irrigation whether your course is large or small



greater need for irrigation as the rootzone is unable to absorb the precipitation and surface run-off wastes the precious resource.

Taking responsibility

'Taking responsibility for Water' is a document produced by the United Kingdom Water Research and Innovation Framework and looks at provisions for water until 2030. Water will be increasingly in demand in the future, it is not a finite resource and golf courses

must make provision for this. In the UK demand is set to increase. Not only will potential consumption rise but owing to urbanisation, road building and residential housing, the amount of water naturally recycled will decrease and the surface run off which lost to drainage will be greater.

The way forward has to be through better understanding of the use of our precious resource. Several golf courses in the UK, Europe and beyond have had success with continued use of potable

water and abstraction rights when they have been in a position to demonstrate they are being proactive in their effective and efficient use of water. The use of water meters to monitor and record specific water use for irrigation purposes on a daily or weekly basis is a must to protect your rights to this water as this provides factual information which can be presented as hard evidence.

An irrigation system is arguably the most expensive piece of equipment in which a golf club



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can invest, but as most of it is out of sight it is frequently neglected. Many irrigation systems in the UK were installed in the eighties and nineties, the boom years for golf, and may be nearing the end of their productive life. They may no longer be fit for purpose or indeed not meet current Health and Safety standards as well as wasting considerable amounts of water. It may be the time to analyse whether it is expedient to sit back and do nothing, repair the ailing system, upgrade it or grasp the nettle and replace the existing system.

A thorough Irrigation System Audit from a competent and independent irrigation consultant will look at all aspects of the irrigation system.

So, should you repair, upgrade or replace? Repair will almost certainly be the least expensive, but will it be the most cost effective over time? Upgrading may involve looking at the whole ethos of 'what do we wish to irrigate?' and any upgrade should always be balanced with the integrity of the existing system.

If the decision is to replace then there may be no need to replace the whole irrigation system in one year, a phased approach could be adopted provided the new plan is embedded in the overall golf club management plan.

Design

The design and designer must rank high in the efficiency of any irrigation system and when coupled with a detailed knowledge and understanding of the equipment available in the marketplace, will save water.

A tees and greens only system will certainly use considerably less water than a wall to wall fairway design. Sprinkler arc settings set to 180 degrees rather than 360 degrees will also reduce water application volumes provided the sprinkler run times are adjusted accordingly.

Deciding the priorities and parameters of your irrigation requirements are a matter of individual choice. Areas can be targeted accurately for specific irrigation needs, one only needs to witness the accuracy of targeted areas demonstrated on desert courses in both America and the Middle East. Accurate design, spacing and installation of sprinklers to ensure head to head contact is vital in ensuring efficient coverage.

The use of specific design software to select the most efficient irrigation sprinkler and nozzle for

the desired spacing is extremely important to ensure efficient use of water. Modern sprinklers can also deliver the irrigation trajectory at lower angles, helping to ensure better distribution in windy conditions. Sprinkler run times and application rates need to be within the bounds of the infiltration rate using a repeat and soak cycle if necessary.

Monitoring conditions

Accurate monitoring and recording of soil moisture deficit conditions will allow the irrigation manager to balance and modify the daily application rate. After a period of natural precipitation it is not only pointless but profligate to apply irrigation which takes the soil moisture level above field capacity.

The days of ten minutes per night to all areas of the course are over. Water balance sheets have now largely been superseded by weather stations and soil moisture monitors, which can be directly linked to the irrigation central computer controller.

I might add that all too often when making a return site visit to a Golf Club where an irrigation system has been installed in the past, the initial irrigation programme has not been altered or modified. Workshops on irrigation design and maintenance are available at BTME.

The move toward improved sustainability within our industry is something which is here to stay. The advancement in irrigation design, irrigation central control and sprinkler technologies are a vital piece of the jigsaw and irrigation manufacturers are constantly striving to ensure the efficient use of water by their products. There are irrigation computer controllers which now schedule sprinkler run times in seconds rather than minutes.

One area in which advances are rarely mentioned is turf grass species. We irrigate to ensure the survival of our grasses which make up our playing surfaces and it is their requirement for water which ultimately determines how much we apply.

The use of improved cultivars of grasses which have a lower water use rate and those with deeper rooting to ensure water availability in the soil is maximised is a must.

The composition of the rootzone is also an important factor and how this is managed an even more important factor. So when we consider efficiency within our irrigation system we should also consider



the species composition and the rootzone as these have considerable bearing on the water demand for irrigation.

Undoubtedly there is going to be more pressure on our most precious resource – water - in the future.

As an industry I truly believe our practices are efficient and often more so than other industries whose use of water is far greater than ours. Perhaps our voice is sometimes least heard or maybe least recognised, even though we provide pleasure and enjoyment for so many people.

I feel we need to communicate our need for water, not as a need for yield, as in the turf industry yield is not our goal; our goal is sufficient water only to maintain growth and a quality playing surface.

Communicate with your membership and explain the principles of water management, audit your irrigation system to ensure you have an efficient system design, regularly maintain and service your irrigation system, identify your priorities for irrigation in a worst case scenario and repair, upgrade or replace as necessary, but above all be proactive in your water management policy.

“As an industry I truly believe our practices are efficient and often more so than other industries whose use of water is far greater than ours”



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Dr Terry Mabbett on how EU directives on chemical pesticides are continuing to pressurise the sports turf industry

Looking at the onslaughts by the EU on chemical pesticides you could be forgiven for believing that chemical control of insect pests, diseases and weeds is 'drinking in the last chance saloon'. Brussels continues to fire bureaucratic broadsides at a whole raft of industries for which chemical pesticides are traditionally used to manage economically important and environmentally destructive biological agents.

Professional sports turf is a small part of the big pesticide picture and contributes tiny amounts to overall environment loading, but turf suffers disproportionately from what goes on in adjacent areas including arable crop spraying and hard surface applications.

Substantial overlap can occur in the use of specific active ingredients with serious implications for turf.

The consequences of broad acre insecticide treatment of cereal crops and high run off risks from total (non-selective) herbicides application to roads, pavements and industrial hard surfaces can seriously impact on golf courses.

Game changing directives

The turf industry is ahead of the game in pesticide use and regulation, but a clutch of EU directives are now pushing the sports turf industry much faster and further than could have reasonably been projected or imagined just ten years ago. Biocides are increasingly brandished as the only option for long term sustainable protection of professional turf.

However superficially attractive biocontrol products may be, they are already being outstripped and overtaken by chemical pesticides of biological origin.

Classic examples include azoxystrobin - a fungicide first discovered during research on wild mushrooms commonly found in Czech Republic forests - and fludioxonil, a fungicide inspired by a naturally occurring antifungal compound produced by some soil bacteria.

These biological fungicides are potent and highly targeted which means just a fraction of that normally used for more conventional turf fungicides can be used to manage turf diseases.

Biological origins and credentials make them less environmentally intrusive and more readily removed from the soil. With reduced dosage and less persistence comes lower environmental loading.

Enter application

Forty years ago pesticide application was simply a means of getting a dose of chemical from point A (the spray tank) to point B (the plant surface). Accuracy, wastage and contamination were generally not considered and pesticide application to turf was still very much the poor relation of agricultural spraying. Early attempts at controlled droplet application were generally regarded as unwanted assaults on sales volumes and targets.

Today's chemical companies regard sound application as a safeguard for new products, and in a wider context an important factor in sustaining chemical control. Regulators want to know exactly how much pesticide is being placed and where, and how this translates into maximum efficacy from minimum loading (dose) with negligible environmental contamination.

With regard to pesticide application, the turf industry is now 'its own man'. New application techniques are custom designed to suit golf course topography and developed to accommodate the canopy characteristics and control requirements of closely mown turf grass.

These trends are encapsulated in the evolutionary development of the XC nozzle range by Syngenta for reduced drift application to turf over undulating surfaces on golf courses.

A day at Hanbury Manor

I didn't have to travel far to see Syngenta's new XC nozzle range in action at Hanbury Manor Golf Course in Hertfordshire. On a sunny day I met Dr Simon Watson (Technical Manager EAME Turf & Landscape) and Caroline Scott (Marketing Communications Manager EAME Turf & Landscape) from Syngenta, and Stan Power, Golf & Estate Manager at Hanbury Manor. Stan was one of many greenkeepers instrumental in bringing practical spray application problems faced by greenkeepers to Syngenta's attention.

Stan now uses XC Nozzles for the application of fungicide and soluble nutrients to his greens and fairways at Hanbury Manor. He and his team are clearly doing the right thing for their turf in Hertfordshire. Irrespective of best management practice you would expect greens in mid February - when I visited - to look at least a little jaded but these were as pristine and shining as the day itself.



NAsOR - Calling All Greenkeepers

NAsOR (National Amenity Sprayer Operators Register) is a professional register designed for spray operators in the amenity sector. It provides members with Continuing Professional Development (CPD) opportunities to update their skills and to record learning. The scheme is open to anybody who holds a City & Guilds NPTC Safe use of Pesticides Certificate of Competence; a minimum of a PA1 foundation module, plus one or more of the Pesticide Application Modules (PA2-PA13).

Members are required to collect 30 or more CPD points in each three year period to qualify for membership renewal. A wide range of CPD events and courses are approved for NAsOR members and are publicised under the events section of the NAsOR website.

Members are required to:

- Ensure that any equipment is being used in accordance with current legislation.
- Have due regard to any environmental impact.
- Give priority to the health and safety of bystanders and those that use areas being treated.
- Use equipment that provides protection to operators under current health safety and legislation

The benefits of joining City & Guilds NAsOR include:

- Recognition and professional development
- Up-to-date knowledge for more efficient and effective use of pesticides
- Proven skills for professional spray application techniques
- Supporting career development through on-going CPD
- Independent recognition of good operator standards for higher business achievement

To join simply go to www.nasor.org.uk and click on "Join Now" on the banner at the top of the page. Applicants will require an e-mail address and have a qualification in the Safe Use of Pesticides.



Application hurdles on golf courses

Nozzle technology and how it affects droplet size, trajectory and impaction is not the easiest thing to understand but Simon succinctly reduced the situation to several core issues requiring resolution and engineering solutions. He said: "Syngenta was faced with resolving a number of practical spraying issues sometimes unique to the amenity sector and the golf course landscape and environment in particular."

Standard flat fan nozzles are designed to produce overlapping even coverage at 50cm from the ground, but that is not a constant option on golf courses especially around greens. "We don't have the luxury of spraying over the uniformly flat surface of a Norfolk wheat field" says Stan, adding how greenkeepers are often faced with variable gradients and undulating ground with recurring reductions in nozzle height to just 30cm from turf surfaces.

Loss of pattering means undulating turf receives spray in peaks with accompanying overdosing directly underneath nozzles and gaps with under-dosing between nozzles. "We told Syngenta how this

was a big issue for greenkeepers" said Stan. "It was always obvious, especially following the application of 'colouring up' nutrients like iron with their high visual effect. Equivalent problems in overdosing and underdosing with fungicides may not have been so obvious, but effect and consequences related to efficacy and environmental loading are even more important."

The nozzle brief

Syngenta's task was to design and develop novel nozzle technology which could maintain pattering at different nozzle heights over undulating ground while simultaneously minimising the proportion of small diameter high drift potential droplets. It all sounds relatively easy but as Simon pointed out droplet size, momentum, trajectory and overall effect on turf target impaction is very much a double edged sword requiring rationalisation before resolution.

Small droplets are retained well on narrow acute angled leaf surfaces typical of close mown turf but lack the mass and momentum to penetrate the layer of still air which surrounds all plant surfaces. Penetration and impaction problems for small droplets are accentuated

about the author



Dr Terry Mabbett

Dr Terry Mabbett is a disease, pest and weed control specialist with forty years international experience covering research, advisory and journalism. His current fields of focus are professional turf and alien insect pests and pathogens of Britain's native and naturalised trees.

on ultra-low profile turf grass surfaces because there is nowhere for the layer of air to be displaced to. Net result is poor impaction of small spray droplets already prone to drift.

Water is invariably nearby in most areas of spraying but golf courses are especially well endowed and equipped with water features. Water features – ponds, lakes, streams and ditches – have always been incorporated to maximum effect during golf course design and layout and were boosted during the mid-nineties when the 'American Design' (Jack Nicklaus course) came to the UK and Ireland in an increasingly big way. For instance, man-made lakes were placed close to greens to make courses that much harder to play. Net overall result is golf course spraying never being far away from water and all the implications related to LERAP and buffer zones. LERAP considerations must take into account dry ditches as well as all currently flowing and standing water with its integral aquatic life and water margin plants.

So the larger higher momentum droplets, with good on target trajectory and reduced susceptibility to drift, are the answer, but there is yet another 'catch-22' situation

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here. Due to correspondingly large contact angles created with leaf surfaces impacting large droplets have a tendency to roll off, while inherent high momentum means they may shatter on impact that could reduce retention on the leaf target.

However, as Simon points out these situations can be recovered to some extent when using new age protectant fungicides like fludioxonil. "Grass foliage continues to be the prime target for this protectant fungicide", he says, "but it will also destroy the spores of thatch inhabiting fungi causing turf diseases such as Fusarium patch and anthracnose, so any fungicide falling through the net is not wasted."

XC Technology uses a novel elliptical shaped nozzle orifice and wide droplet pattern to ensure effective coverage with variable nozzle height above the ground and accommodates air induction technology. As the spray liquid passes through the nozzle chamber, air is sucked in through holes to create the so called 'Venturi' effect which incorporates a tiny volume of air into each spray droplet.

Air incorporation gives more consistently sized droplets with a well maintained trajectory on target, and an air 'cushion' effect that lowers contact angle, reduces

roll off and helps to prevent these large droplets shattering on impact.

Practical benefits

Spraying water from a static boom on the car park's hard surface, and following up with spray liquid collection in measuring cylinders under each nozzle, Simon Watson demonstrated how in uniformity, accuracy and patterning the XC nozzle range does exactly what it says on the label. Stan Power then took his Toro 5700 sprayer over some of the undulating ground around the greens at Hanbury Manor so we could see the system in action.

So what are the practical benefits? Use of Syngenta's XC reduced drift nozzle technology widens the window of spray opportunity. Caroline Scott who manages Syngenta's Greencast system calculates that greenkeepers using XC Nozzles will have four extra days per month to spray.

With the enhanced droplet size distribution and superior coverage provided by the XC nozzle system Stan has reduced spray volume from 500 L/ha down to 250 L/ha (300 L/ha average). "This means I can spray 3.2 ha using the full 1100 L tank whereas before I could

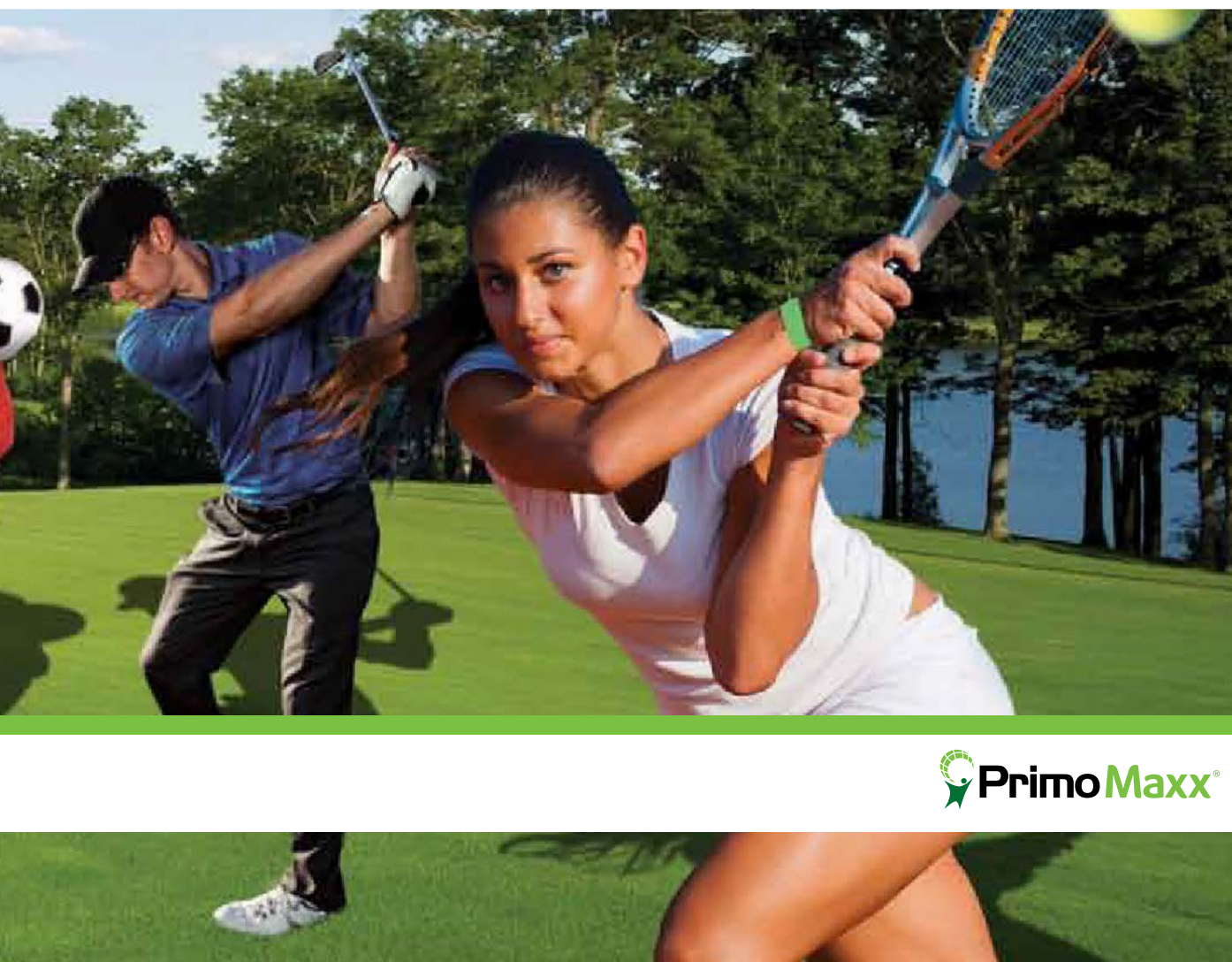
"The turf industry is ahead of the game in pesticide use and regulation, but a clutch of EU directives are now pushing the sports turf industry much faster and further than could have reasonably been projected or imagined just ten years ago"

only manage 2 ha. It provides much more flexibility and can prove critical when allowing me to carry out a task in 2 hours instead of 4.

"This might not seem a lot but is a real blessing when we are under pressure during pre-match periods."

"The flexibility afforded by XC nozzles also extends into what kind of foliar feed I can apply", said Stan, "by allowing me to spray when conditions are most favourable for fast and efficient nutrient uptake by leaf surfaces or simply because it is more convenient."

Last but not least is the LERAP consideration which allows for measures to reduce buffer zones around water courses and features. Nozzle technology is one of them.



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Section Notes

Please email your notes to steve.castle@bigga.co.uk by the 15th of the month

All the latest news from your Section

Around The Green



SCOTLAND



CENTRAL

Congratulations to Paul Armour of Lochgelly GC who has recently become a dad, a good excuse for not making the spring outing as he's still trying to get caught up on his sleep. All the BIGGA members at gWest are also in for a change shortly as the course opens for play this month. It will be strange to have golfers out there after an extended grow in, welcome to the real world guys!

We have an education event planned for 7.30pm on Thursday 6 June. The venue is likely to be Elmwood College and the speaker is Mike Jouson of Clear Communications. Mike is a regular presenter at the GIS show for American Superintendents at their February events and the seminar will be suitable for all categories of members from students and people starting out in the industry to Course Managers. Full details will be emailed out to everyone nearer the time.

Finally, we had 40 members participate in the spring outing over the Carnoustie Burnside course on 17 April. 38 members braved the constant rain and principal winners were: scratch – Scott Thomson, Strathmore, best net – Richard Jenkinson, gWest, class 1 winner, Shaun McNaughton, Auchterarder GC, class 2 winner, George Pendrich, Scotsraig GC. A full list of prizewinners is on our website www.biggacentralsection.org.uk, thanks to the trade for their full support and Carnoustie Links Management and green staff for the course which was in great condition.

Gordon Moir



EAST

Good to see that spring has actually started to arrive, better late than never I say as the weather has been wreaking havoc - if it's not snow it's the wind blowing tons of sand over our courses. I received a picture recently taken at North Berwick west links after sand had blown onto their 1st fairway to create a massive new temporary bunker! Think it was a hard shift to get the area back to normal by all accounts.

I can confirm we have the opportunity to attend a get together at Mussleburgh races on May 24 for some banter and a catch up (and I have been reliably informed that our new Vice Chairman has got us two red hot tips for the night also!). The first race is at 6.15pm on the night, please contact the section if you are interested in attending.

The first spectator stands have started to go up at Muirfield and I'm pleased to say that our secretary Stuart Ferguson has been successful in his selection for the Open Support Team. By the time this report appears the spring outing will have been completed at Seahouses, report to follow next month.

Last month I was fortunate enough to write a small article for GI (sorry about the picture guys, but that's my best side!) again if anyone fancies writing a piece then please get in touch and this can be sorted out - it's good fun guys so lets give it a go. Until next month, keep your blades sharp and remember to apply lots of suncream with all the sun that's coming...

Scott Corrigan scottcorrigan4@aol.com or 07877098237



NORTH

Hope this report finds you all well and getting those greens into shape for another busy season.

Again not a lot to say at this time of the year but by the time you get this report we will have had our outing at Duff House Royal and the winners and losers will all have been sorted out and also the winners of the 200 club. All the results will follow in the next issue.

Warren Beveridge is sadly leaving Peterculter Golf Club after seven years and leaving greenkeeping so we would like to wish him all the best for the future. Paul Sharp has replaced Warren with Stevie Cocker from Inchmarlo Golf Club so we would like to wish him all the best in his new job and just in time to learn how to operate all that wonderful new machinery.

Robert Patterson was saying that his squad has started a five a side football team and is playing at Goals on a regular basis they call themselves the turf technicians but they were soundly beaten in their first match by a bunch of oil workers.

Were it not for a great goal-keeping display from Mike Braidwood the ref would have lost count by half time. I bet Barcelona are running scared. So if any other clubs want to give them a game feel free.

Hughie McLatchie is now getting over his hip operation and well into the golf again so best wishes to him. That's it for this month please call with any news big or small - call Robert Patterson on 07931639548 or Dale Robertson on 07784517534.

NORTHERN



NORTH EAST

Right we have no shortage of news this month for a change. I mentioned last month that two greenkeepers had been chosen from the section to work on the Support team for this years Open, well there's a third going which I didn't know of until recently and that's David Wilkinson from Whitley Bay GC sorry about that David.

On Thursday 11 April at Tyne-side GC we had a seminar which was reasonably attended and by the feedback received it was well worth it. Greenkeepers from the following golf courses attended: Tyneside, Ponteland, Whitley Bay, Hexham, Close House, and a couple of retired ones as well, Associate member Keith Cann-Evans formerly of Hunter Grinders, Glen Baxter of Rigby Taylors. My thanks to Sandra Raper our Regional Administrator for choosing the speakers. John Nicholson did a first class talk on Woodland Management, followed by Andrew McMahon of Rigby Taylor on Recovery, when to fertilise and why - another first class speaker.

There would perhaps have been a handful more if Newcastle hadn't been playing Benfica but we have had that date booked for months - we were able to see the second half in the clubhouse, thanks to Tyneside Golf Club for that.

Ryan Blemmings has just started his level 3 and Andrew Digirolamo has recently started level 2 both with Myerscough College who I think are doing a first class job here in the North East on bringing greenkeepers through their training, credit to the assessors. On April 17th we played our Spring Competition